

## Prospecting Dachstein Massif

I have created two maps for Dachstein 2018 expedition members to start thinking about prospecting for undocumented cave entrances and digging into known entrances. The maps can be accessed in this Facebook group's Files section under the names "Dachstein Prospecting Map North" and "Dachstein Prospecting Map South." Neither map shows already known cave entrances or already surveyed cave passages, and thus are only preliminary maps intended to get you thinking about how and where to prospect. Maps containing known entrances and surveyed passages will become accessible via Axel Hack to exped members when you are actually on site. I'm sure you all can appreciate the need to prevent unrestricted internet access to this information.

Before reviewing the two maps, I suggest that you read two articles that I have put up on my *On Rappel* blog:

<https://tinyurl.com/ybm3angm> – Dachstein Massif Geology Intro

<https://tinyurl.com/ycem7ljc> – High Moor Caves

Hopefully, many of you have already read the first article; I posted the second one only a few days ago. These articles give background information preparatory to understanding why I prepared the two prospecting maps and why I recommend (below) where prospectors should look for new cave entrances. Bear in mind, however, that I am the new guy on the block and thus do not really have a handle on where prospecting has historically focused and where it has not. For that level of detail, you must rely on exped leaders. Thus, if I recommend prospecting a particular area that Joel or Matt tells you has already been thoroughly explored, you should ignore my recommendation.

In addition, I am uploading to the Facebook Files the Austrian geology map and its accompanying geologic cross-section graphic. Ari Cooper-Davis found this online, and Andrew McLeod may also have a paper copy on site.

### Map Mechanics

The two maps I created are based on expedition QGIS files created by Axel Hack, and include topography, trails, roads, buildings, peaks, surveyed cave passages, and cave entrances. To these, I have added a few geological features lifted from the geology map, including known faults, inferred faults, two fossil sites, Hirlatz Limestone surface occurrences, and high moors.

Contour lines are at 50m intervals. Bold black solid lines represent known faults that I suppose are fairly obvious in the field to a geologist. I sure hope you can recognize them in the field. The gray dashed lines represent inferred faults. Pink polygons depict the locations of Hirlatz Limestone deposits and blue polygons are high moors. Known faults, inferred faults, and high moors are numbered for reference. I did not number the Hirlatz polygons because known cave entrances do not seem to be associated with them, but I could be wrong and it is up to you to evaluate that.

Similarly, the prospecting maps do not include Quaternary (yellow) map units that include moraines because I noticed no correlations between them and cave entrances. My gut feel is that Ice Age moraines would have buried cave entrances, but again, I could be wrong about that.

My *Geology Intro* blog writ mentioned the Hallstatt Limestone because I was mistaken about where the project area was located on the Austrian geology map. Duh, now that I have the location straight, we can forget about the Hallstatt Limestone this year and consider instead the Hirlatz Limestone.

### Field Prospecting

This section outlines my recommendations for prospecting specific areas within the project area. They are limited to the lands lying west of the valley bottomed by fault #4. Again, first seek guidance from exped leadership before blindly following my suggestions.

One thing that immediately stands out is that nearly all the known entrances are above 1700m. I don't know if that's for some geological reason or if it's due to prospectors focusing on the higher elevations in order to achieve maximum cave

depth potential. I do know, however, that there are only five known entrances to the Hirlatz (six with WUG?), and that additional, lower entrances would make the exploration of Hirlatz easier. For example, the Hirlatz passes “only” about 400m below fault #4 valley AND on the far side of the sump separating WUG from the main cave system. Although 400m is still quite a bit of rope-work, it is better than the 600m WUG pot.

Tiergarten sinkhole and cave lay directly above Hirlatzhöhle at the edge of this valley. For sure the two communicate, but Tiergarten’s passages have been pushed to no avail. Note that the Tiergarten is on a fault (#61) defined by a cliff edge. It might be productive to prospect northwesterly from the Tiergarten if that has not already been done. However, the approach in that direction is through a miserable boulder field (moraine?) that is obscured by lush vegetation. If you explore that area, wear shin guards and take a walking stick or two for balancing (they will also double as splints if you break a leg!). Alternatively, the Wiesberghaus trail skirts the boulder field and approaches fault #61 at its northwestern terminus, so it might be better to access the fault from there.

Closer to Camelot, fault #54 (two known entrances) tees into fault #55 (one known entrance), which then doglegs into fault #56 (no recorded entrances). It is unlikely that new entrances will be found along fault #55, as a trail runs over and beside it, so any such entrances would likely have been found long ago. However, it might be productive to survey along fault #56.

Many fault lines have one or more associated cave entrances; however, entrances do not seem to be densely clustered along the faults. Exceptions to this include faults #19 and #26, which respectively have four and five entrances mapped directly on them. I would be inclined to believe that #19 has so many simply because there are many known entrances relatively close by, but that is not at all the case with #26. The five #26 entrances are all along a trail where they would be easy to spot, but then the entrances peter out moving northeasterly from the trail. Moving right along, fault #28 has a swarm of (8 or 10) entrances, but only one entrance along its continuation as fault #27. This latter might be productive.

Similar observations can be made regarding a lot of the other faults. In this light, my recommendation is for prospectors to find the faults in the field and follow them specifically. Ideally, I would start by locating a given fault on the ground, then finding known entrances associated with that fault, and then ascertaining whether the entrances are actually along the fault or merely nearby. If they prove to be truly associated with the fault, then we have a demonstrated method for finding entrances that justifies a deliberate inspection of the entire fault. Accurate georeferencing is imperative.

As I discussed in my high moors blog post, I recommend prospecting along faults associated with raised bogs. One promising location is the bog complex located northwest and downhill of Tiergarten. These bogs are roughly linear in shape, oriented NE-SW and 90° off that, and apparently in large part follow mapped fault lines. These faults may well be plugged with peat, as most are depicted as inferred faults. Faults #5, #6, and #11 terminate at the edges of the raised bogs; these terminations are excellent prospects. Inferred faults #106, #107, and #108 lay under the high moors and are presumably plugged with peat, but they should be checked if they can be walked.

Fault #7 is interesting, as it is within a notch (Versturz Canyon?) between Gamskogel and Grunkogel peaks extending from the terminus of high moor #7 and an adjacent Hirlatz Limestone unit. Evidently, acidic drainage from high moor #7 etched out the canyon at least in part, so there might be a cave here.

Furthermore, there are other raised bogs with associated solid fault lines shown on the geology map, some being not very far from the WUG entrance. Those would also be my first choices to investigate. This phenomenon has the potential to become a prospecting search model.

The Austrian geology map does not depict any dikes within the project area, so my maps do not portray any. However, the Dachstein Limestone is known to have occasional dikes and syndimentary columns, so prospectors should be alert for them in the field and their potential for cave entrance formation.

During the expedition, let me know if you need any more faults or other features added to the QGIS file and I'll do so as soon as I can. Additionally, if you want to prospect outside of the area that I have covered, I can expand the project area to suit.

Good Luck!!!